

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A magnetic displacement measurement device, comprising a ruler body and a vernier which can move with respect to the ruler body, wherein a magnetic main ruler is fixed on the ruler body, and a secondary ruler is fixed on the vernier; the secondary ruler comprises a magnetic sensor and a measurement circuit thereon; said measurement circuit outputs the signal of movement distance to ~~[[an]]~~ a signal output device; being characterized in that:

said magnetic main ruler is of grid type, wherein grids are arranged at a constant interval along a movement direction with a grid pitch of λ ;

said magnetic sensor is composed of giant magnetoresistances which are opposite to the magnetic main ruler and arranged along the movement direction; and

said measurement circuit comprises at least two measurement bridges which are composed of giant magnetoresistances and are electrically connected with an AC power supply, such that the measurement bridges receive AC power as input.

2. (Currently Amended) The magnetic displacement measurement device according to claim 1, being characterized in that: said magnetic main ruler is provided such that magnetic grids arranged with a grid pitch of λ are provided on a nonmagnetic material substrate, and the magnetic grids form a grid-type magnetic field with a permanent magnet, or are magnetized directly to form a grid-type magnetic field.

3. (Currently Amended) The magnetic displacement measurement device according to claim 1, being characterized in that: the giant magnetoresistances of said magnetic sensor are formed of at least one layer of magnetic film and nonmagnetic film which are alternately arranged.

4. (Currently Amended) The magnetic displacement measurement device according to claim 3, being characterized in that: the magnetic film of said giant magnetoresistances is selected from one of metal film, alloy film or semiconductor film.

5. (Currently Amended) The magnetic displacement measurement device according to claim 1, being characterized in that: ~~said at least two measurement bridges are electrically connected with an AC power supply, and~~ the phase difference of the AC power supply connected with said at least two measurement bridges is $\pi/2$.

6. (Currently Amended) The magnetic displacement measurement device according to claim 1, being characterized in that: said magnetic main ruler is provided such that magnetic grids arranged with a grid pitch of λ are provided on a nonmagnetic material substrate; the giant magnetoresistances of said magnetic sensor are formed of at least one layer of magnetic film and nonmagnetic film which are alternately arranged; ~~said at least two measurement bridges are electrically connected with an AC power supply, and~~ the phase difference of the AC power supply connected with two measurement bridges is $\pi/2$.

7. (Currently Amended) The magnetic displacement measurement device according to claim 1 or 6, being characterized in that: the position difference between the ~~magnetoresistances~~ giant magnetoresistance of an arm of one of the two measurement bridges and that of an arm, which locates in a corresponding position therewith, of the other of the the same arms of said two measurements measurement bridges is $n\lambda/4$, wherein $n=1,3,5,7 \dots$

8. (Currently Amended) The magnetic displacement measurement device according to claim 1[[, 5]] or [[7]] 5, being characterized in that: the measurement bridge with a position lead of $n\lambda/4$ is provided with an AC signal with a phase lag of $\pi/2$, wherein $n=1,3,5,7 \dots$; the measurement bridge with a position lag of $n\lambda/4$ is provided with an AC signal with a phase lead of $\pi/2$, wherein $n=1,3,5,7 \dots$

9. (Currently Amended) The magnetic displacement measurement device according to claim 1 or 6, being characterized in that: said measurement bridges are composed of at least two giant magnetoresistances, wherein ~~at least two~~ respective adjacent

resistors of two adjacent arms of a single bridge ~~the bridges~~ are giant magnetoresistances with a position difference of $n\lambda/2$, $n=1,3,5,7\dots$

10. (Currently Amended) The magnetic displacement measurement device according to claim ~~[[9]]~~ 1 or 6, being characterized in that: the position difference between ~~[[two]]~~ respective giant magnetoresistances of two arms ~~which face with~~ facing each other in said measurement bridges is $m\lambda$, wherein $m=0,1,2,3,\dots$

11. (Currently Amended) The magnetic displacement measurement device according to claim 1 or 6, being characterized in that: the giant magnetoresistances on each arm of said measurement bridges are composed of constant number of giant magnetoresistances in series with different positions, and a position difference thereof is $m\lambda$, wherein $m=0,1,2,3,\dots$

12. (Currently Amended) The magnetic displacement measurement device according to claim 1 or 6, being characterized in that: the width of said giant magnetoresistances is smaller than $\lambda/2$ ~~each of magnetoresistances is formed of magnetoresistances with same number and same width in series, with a total width smaller than $\lambda/2$.~~

13. (Currently Amended) The magnetic displacement measurement device according to claim 1 or 6, being characterized in that: said two measurement bridges output signals, a phase of which is in a function relation with the displacement, the signals are summed and then converted into digital signals through A/D conversion, and the digital signals are coupled with the signal output device.

14. (Original) The magnetic displacement measurement device according to claim 2 or 6, being characterized in that: said magnetic main ruler is provided such that magnetic grids with the grid pitch of λ are formed on the nonmagnetic material substrate by plating and etching process, or are embedded in the nonmagnetic material substrate.

15. (Original) The magnetic displacement measurement device according to claim 2 or 6, being characterized in that: said magnetic main ruler is provided such that convexes

and concaves in grid type with the grid pitch of λ are formed on the surface of the magnetic material.